



State of New Jersey

Christine Todd Whitman
Governor

Department of Environmental Protection

Robert C. Shinn, Jr.
Commissioner

Mr. Cristopher Anderson
Director Environmental Affairs
L.E. Carpenter & Company
Suite 36-5000
200 Public Square
Cleveland, OH 44114-2304

AUG 01 2000

Dear Mr. Anderson:

Re: L.E. Carpenter Superfund Site
Wharton, Morris County
Evaluation of Remediation of Groundwater by Natural Attenuation

The New Jersey Department of Environmental Protection (Department) and EPA have reviewed the Evaluation of Remediation of Groundwater by Natural Attenuation and have the following comments:

Department's Comments

1. The Department is unclear what L.E. Carpenter is proposing, i.e., whether it is natural attenuation of the free product, or natural attenuation of the dissolved portions of the plume with active recovery/treatment of the free product. According to the Technical Requirements for Site Remediation, N.J.A.C. 7:26E-6.1(d), natural attenuation of free and/or residual product is not permitted. The Department will consider natural attenuation of the dissolved portions of the plume provided L.E. Carpenter evaluate and implement more effective product recovery.
2. The model, its assumptions and applicability are acceptable, however its implementation is not. Incorrect sampling data was input into the Bioscreen model. Fourth quarter 1999 sampling results indicate 1600 ppb DEHP, not 670 ppb as indicated on Figure 6. DEHP is a persistent compound and this higher result may prove that natural attenuation is not a viable option for the dissolved portion of the plume. Also, sampling results for nearby MW-14s were not included in the modeling, and delineation of both BTEX and DEHP is incomplete along the flow path chosen for the modeling. Please include MW-14s in the modeling. Furthermore, another sampling point directly down-gradient of MW-22 must be added to complete delineation. MW-25 cannot be used because it is probably side-gradient. These deficiencies must be corrected before the Department will consider this proposal for natural attenuation of the dissolved portions of the plume.



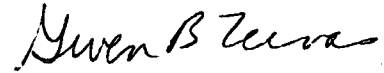
3. Ground water sample data at specific monitor wells is referred to throughout the report, however no reference is made to the particular sample event that corresponds to the reported results. For example, on page 5-1 data is reported for monitor wells MW-14, MW-21, MW-22 and MW-25 without reference to a particular sample event.

EPA's Comments

4. Natural attenuation data presented suggest that the aquifer within the LNAPL area has become anaerobic as a result of biodegradation. It seems likely that the aquifer was initially aerobic, but that oxygen and other electron acceptors have been depleted by biological activity. Currently, in the LNAPL area, very little degradation is likely occurring. However, as contaminants migrate out of the anaerobic area beneath the LNAPL, conditions become aerobic and degradation is likely to be active. Subsequently, the system can be conceptualized as active degradation on the perimeter of the plume, with little or no degradation in the area under the LNAPL.
5. As a result of the above dynamics, the extent of the plume is likely partly controlled by the location of the aerobic-anaerobic boundary, and not solely by the actual flow of ground water.
6. The Bioscreen modeling presented in the report should be largely viewed as an academic exercise and not as an accurate representation of site conditions. First, the model assumes that degradation is occurring at a single rate along the flow path. As noted above, degradation is likely occurring only at the fringe of the plume. Also, the inputs to the model are largely based on literature values and general assumptions, not on site specific characteristics.
7. Pages 7-5 and 7-6 present a number of calculations of the percent of contaminants that have been degraded. The subsequent figures are based on an assumed high source input and a resulting assumed high degradation rate to produce the current known extent of the plume. However, this type of reverse engineering exercise and the use of these inputs are not a valid way to determine what percentage of the contaminant mass has been degraded.
8. Notwithstanding the above, it does appear that biodegradation has effectively kept the plume to a very slow rate of expansion. The rate of expansion may be most easily studied by examining changes in the concentration of natural attenuation parameters at wells along the periphery of the plume. Have the oxygen and ORP values at MW-22 and MW-25 decreased with time? If natural attenuation processes were to be accepted as the means of remediation, the time frame for cleanup would likely be most controlled by the extent of source removal and the supply of oxygen in the aquifer. Efforts to increase source removal are to be addressed in a pending FFS document. It seems reasonable to consider enhancing the oxygen content of the aquifer as a possible, effective alternative to pump and treat. As mentioned in the comments on the Free Product Alternative Analysis, this could be done as pilot work in tandem with other technologies designed to enhance source removal.

Please contact me at (609) 633-7261 if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Gwen B. Zervas".

Gwen B. Zervas, P.E.
Case Manager
Bureau of Case Management

C: Stephen Cipot, EPA
Nicholas Clevett, RMT
George Blyskun, BGWPA
John Prendergast, BEERA